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# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Polarised Electromagnetic Driving System

We, SIEMENS & HALSKE AKTIENGESELLSCHAFT, a German Company, of Berlin and 4, Wittelbacherplatz, Munich 2, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a polarised electromagnetic driving system, fed with alternating current, for relays, alarms or the like, and has for its object to provide a driving system which can be produced with maximum simplicity.

According to the invention there is provided a polarised electromagnetic driving system for relays and the like, the driving system having a magnetic arrangement comprising two magnetisable parts disposed adjacent to, and spaced apart, from each other, at least one permanent magnet located between said parts to magnetise said parts so that the latter form two pairs of magnetic poles, a coil for connection to an alternating current source, and an armature pivotally mounted at its centre of gravity, one end of the armature being between one pair of said poles and the other end between the other pair of said poles, the arrangement being such that when the coil is energised the pole strengths are varied whereby the armature is caused to move about its pivot.

As compared with the known alternating-current alarms, this arrangement has the advantage that the individual parts, and especially the permanent magnet, can be fashioned in very simple form. In addition, the driving system has the advantage that four-poles are provided comprising two salient pole pairs, in which the magnetic forces acting on the armature are utilised to move the armature at all four poles.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made to the accompanying drawings which shows one embodiment of the invention. The soft-iron core

of the driving system, which is surrounded by the coil  $S_p$ , consists of two parallel soft-iron parts W of U-form which may consist of two iron laminations or of two bundles of soft-iron laminations. Disposed between the said two parallel soft-iron parts are the permanent magnets M, the magnetic field of which, which is directed by an arrow N—S (north pole, south pole), is directed vertically upwards. Naturally, instead of the two small permanent magnets between the two arms of the soft-iron parts, a single permanent magnet may be provided which lies within the alternating-current coil between the two soft-iron parts. The permanent magnets form at the ends of the arms of the soft-iron parts two pole pairs whose polarity is indicated in the figure by the reference N—S (north pole, south pole). The armature A is mounted outside the coil at the centre of gravity midway between the two pole pairs, so that its two ends, one of which is provided for example, with a clapper K to operate an alternating current alarm, can move freely between the two pole pairs. The whole driving system may be mounted on the securing angle pieces B. When the coil  $S_p$  is energised by alternating current, the north pole, for example of one pole pair is weakened and the south pole thereof strengthened by one half-cycle of the alternating current, while the north pole of the other pole is strengthened and the south pole thereof weakened. In the next half-cycle of the alternating current, the magnetic forces in the two pole pairs are reversed. The magnetic forces of the two pole pairs thus always produce a torque in the same direction on the two armature halves.

What we claim is:—

1. Polarised electromagnetic driving system for relays and the like, the driving system having a magnetic arrangement comprising two magnetisable parts disposed adjacent to, and spaced apart, from each other, at least one permanent magnet located between said parts to magnetise said parts so that the latter form two pairs of magnetic poles, a coil for

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connection to an alternating current source, and an armature pivotally mounted at its centre of gravity, one end of the armature being between one pair of said poles and the other end between the other pair of said poles, the arrangement being such that when the coil is energised the pole strengths are varied whereby the armature is caused to move about its pivot.

2. Polarised electromagnetic driving system according to claim 1, wherein the armature is mounted outside the alternating-current coil, wherein the centre of gravity is midway between the two pole pairs, and wherein the armature oscillates between the two pole pairs.

3. Polarised electromagnetic driving system

according to claim 1, wherein the parts are U-shaped, parallel and of soft-iron, and wherein a permanent magnet is provided between each two pairs of arms and each two opposite arm ends of the two soft-iron parts form a pole pair.

4. Polarised electromagnetic driving system fed with alternating current, substantially as hereinbefore described with reference to and illustrated by the accompanying drawing.

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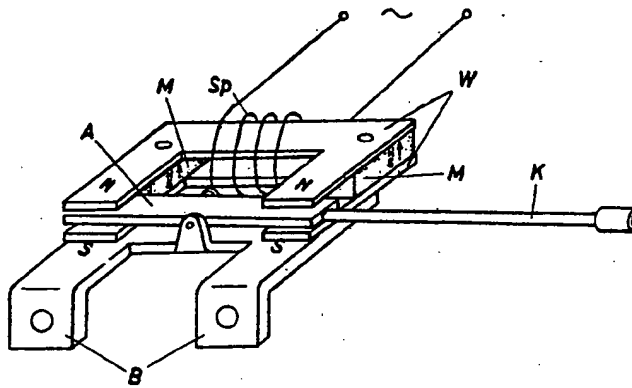
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724,978 COMPLETE SPECIFICATION

1 SHEET

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